

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of) WT Docket No. 10-4
the Commission's Rules to Improve Wireless)
Coverage Through the Use of Signal Boosters)

To: The Commission

COMMENTS

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Summary

The Blooston Licensees support the development and deployment of “well-designed” signal booster devices, provided that these signal boosters are designed so that they cannot cause harmful interference to the networks of other wireless carriers or licensees.

The Blooston Licensees do not disagree that signal coverage gaps exist that could be remedied by well-designed signal booster devices. This is especially true where the subscriber is located on the fringe of a cell site’s service area, in rural areas where there are great distances between cell sites and in urbanized areas where building signal penetration may be poor. It is important to note that in addition to being beneficial to consumers, the proper use of signal boosters will also benefit public safety entities. This is because modern public safety communications systems utilize commercial wireless systems for their back-bone to transmit data between their computer-aided dispatch (“CAD”) systems, mobile data computers (“MDCs”) in police cars, fire trucks and ambulances, and the public safety agency’s computer servers. These systems have proliferated because they significantly reduce the amount of radio traffic over the voice dispatch and incident channels and, therefore, the workload on the dispatchers at the Public Safety Answering Point (“PSAP”). Because these systems rely on commercial wireless carriers for their back-bone, it is not unusual for there to be coverage gaps. As a result, it is not uncommon for MDCs to miss calls for service, or even worse, make units appear to be unavailable for call at the dispatch center/PSAP. In order to alleviate this problem, many public safety systems utilize carrier-installed signal boosters in order to ensure that fire trucks and ambulances remain connected to the CAD system when they are in their stations.

The issue that arises from the unregulated use of signal booster devices is the potential for harmful interference to commercial wireless, public safety systems and other communications systems operating in the same or adjoining bands. In circumstances where service has been degraded due to poor signal, it has not been uncommon for subscribers to deploy wide-band signal boosters without the approval of their carrier. These wide-band signal boosters are capable of boosting the signal of multiple carriers and are therefore prone to causing harmful interference to other carriers and public safety systems since the boosted signal covers a wider range of spectrum than that used by the particular carrier whose signal requires boosting. As a result, these signals are prone to noise which takes the form of adjacent channel interference (“near-far problem”), oscillation or cell site/base station overload. These problems are not theoretical inasmuch as it is well known that signal boosters have caused harmful interference to public safety systems operating in the 800 MHz band and to wireless carriers.

In addition to the interference issues described above, handset signal boosters have also had the unintended consequence of disrupting network-based E911 systems that use

GPS to determine the location of a mobile handset. The problem occurs because the Location Management Unit (“LMU”) at the carrier’s cell site receives two signals from the handset – the boosted signal and the normal signal. Because these signals arrive at different times, the LMU’s location calculations can be skewed by up to several kilometers – which in turn, will have a negative impact on the PSAP’s ability to send first responders in the event of an emergency since the PSAP will not be able to accurately identify the caller’s location.

The best method for regulating the use of signal booster devices is to treat them as subscriber equipment, much like handsets and air-cards, so that wireless carriers can ensure that these devices only operate on frequencies utilized by and at locations authorized by the subscriber’s carrier. This will minimize the potential for harmful interference to other carriers and public safety entities. Likewise, this alternative would be administratively efficient for the Commission and the wireless carriers while meeting the needs of wireless subscribers. The Blooston Licensees oppose the Commission’s proposal to regulate signal boosters as part of the Citizens Band Radio Service under Part 95 of the Commission’s Rules and, as discussed above, urge the Commission to adopt its alternate proposal by authorizing properly certified signal boosters under the existing carrier’s license. This regulatory scheme should follow the proposal put forth by AT&T and would empower carriers to ensure that only compliant signal booster equipment is activated, thereby significantly reducing (if not eliminating) the potential for harmful interference and issues with E911 location accuracy.

Finally, the Commission must not permit any signal booster that does not comply with the Commission’s Rules (meaning that it was installed without the authorization of the underlying carrier) to be grandfathered under any proposed regulatory scheme. The purpose of this proceeding is to eliminate the harmful interference that carriers and public safety entities are currently receiving from wide-band signal booster devices. By grandfathering these devices, the Commission would only perpetuate what has already become a difficult problem for carriers and public safety entities.

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COMMENTS

Blooston, Mordkofsky, Dickens, Duffy & Prendergast, LLP, on behalf of its wireless carrier and public safety clients listed in Attachment A (the "Blooston Licensees"), hereby submits, pursuant to Section 1.415 of the Commission's Rules, its comments in support of the Commission's proposal to permit the development and deployment of "well-designed" signal booster devices, provided that these signal booster devices are designed in such a manner that they cannot cause harmful interference to the networks of other wireless carriers or licensees.¹

The Blooston Licensees believe that the best method for regulating signal booster devices is to treat them as subscriber equipment, much like handsets and air-cards, so that wireless carriers can ensure that these devices only operate on frequencies utilized and at locations authorized by the subscriber's carrier. Doing so would minimize the potential for harmful interference to other carriers and public safety entities, and would be

¹ *Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters*, Notice of Proposed Rulemaking, WT Docket No. 10-4 (FCC-11-53) (Rel. April 16, 2011) ("NPRM").

administratively efficient for the Commission and the wireless carriers, while meeting the needs of their subscribers.

I. There is a Demonstrated Need for Signal Booster Technology in Rural and Urban Settings.

It is not disputed that in certain circumstances, signal coverage gaps exist, whether in rural America or in suburban/urbanized areas.² This is especially true where the subscriber is located on the fringe of a cell site's service area, in a rural area with great distances between cell sites, or in other locations, such as buildings, parking structures, below grade rail systems, etc., where signal penetration is poor. As a result, the Blooston Licensees agree that there is a need for consumer access to well-designed signal booster equipment and believe that the proper use of these well-designed signal boosters will benefit consumers by improving wireless coverage in difficult-to-serve areas and by filling coverage gaps in urban/suburban areas where adequate signal strength is not sufficient to serve mobile devices.

In addition to being beneficial to consumers, the proper use of signal booster technology will provide public safety benefits. As an example, for several years, modern public safety communications systems have utilize commercial wireless systems as the back-bone to transmit data between computer aided dispatch ("CAD") systems, mobile data computers ("MDCs") in police cars, fire trucks and ambulances, and the public safety agency's computer servers. These systems significantly reduce the amount of

² See *NPRM* at 5-6

radio traffic over the voice dispatch and incident channels and, therefore, the workload on the dispatchers at the Public Safety Answering Point (“PSAP”). This is because the MDCs allow police officers and fire fighters/EMTs to receive critical updated dispatch information and to complete incident reports with the dispatch information pre-filled – thereby reducing radio traffic and phone calls to the dispatch center. Additionally, police officers are able to complete several different types of routine checks from their cruisers without intervention from a dispatcher, including: driver’s license status and warrants. These instantaneous data checks provide police officers with a life-line that may save their life, while firefighters and EMT/Paramedics are also able to utilize these devices to obtain information about known hazards and to complete electronic patient care reports. The police reports and fire/EMS reports are then transmitted electronically via the wireless network to an appropriate server where the data is then stored since local printers are not available in the vehicles.

Because these systems rely on commercial wireless carriers for their back-bone, it is not unusual for there to be coverage gaps – whether these gaps are caused by system design issues, terrain or building penetration issues. These coverage gaps can cause MDCs to miss calls for service, or even worse, make units appear to be unavailable for call at the dispatch center/PSAP. In order to overcome this problem, especially in the fire service, wireless carriers have installed signal boosters in many fire stations in order to boost the signal within the apparatus bays so that fire trucks and ambulances are not inadvertently disconnected from the CAD system. As demonstrated by the steps taken in the public safety arena, the Blooston Licensees believe that the proper use of well-

designed signal boosters is a “win-win” for consumers, public safety entities and carriers alike.

II. Wide-Band and Mobile Signal Boosters are Prone to Cause Harmful Interference.

In circumstances where service is degraded due to poor signal, subscribers have often deployed wide-band signal boosters, without the approval of their wireless carriers, as required by the Commission’s Rules.³ The Blooston Licensees are primarily concerned about that these wide-band signal boosters, which are capable of boosting the signal of multiple carriers and are prone to causing harmful interference to other carriers and public safety systems because the boosted signal band covers a wider spectrum band than that used by the carrier whose signal requires boosting by the subscriber. As a result, these signals are prone to “noise” which takes the form of adjacent channel interference, oscillation or cell site/base station overload.

Adjacent channel noise, also known as the “near-far problem,” is a major concern for public safety entities operating in the 800 MHz band and wireless carriers. Wide-band signal boosters can cause interference to other carriers or public safety entities when the booster is far from the intended carrier’s base station (which provides service to the signal booster user) but is closer to another carrier’s/public safety entity’s base

³ In spite of these rules, it is not uncommon for subscribers to purchase and install off-the-shelf signal boosters without the “authorization” of their wireless carrier.

station/cell site that is using an adjacent frequency block.⁴ This is because wide-band signal boosters are designed to amplify any signal within its frequency range (or the “pass-band”) of the signal booster. As a result, the wide-band signal booster does not discriminate and amplifies the signals of all carriers/licensees within its frequency range and not just the intended carrier’s signal that requires boosting. Thus, if the subscriber is close to a competing carrier’s or another licensee’s base station that is within the pass-band of the signal booster, it will receive interference from the booster – thereby disrupting service.

These interference problems are not theoretical. Rather, signal boosters have caused harmful interference to public safety systems operating in the 800 MHz band and to wireless carriers which disrupts critical communications and forces a significant expenditure in resources to remediate. These instances often occur without warning and are difficult to locate and resolve. The Commission notes that Verizon Wireless has experienced signal booster interference to its network that ranged from degrading a single digital channel at a single cell site to multiple channels at multiple cell sites that led to a substantial reduction in cell coverage, loss of cell channels, sectors or cell sites altogether.⁵ Likewise, US Cellular has had one episode where an engineer spent four weeks and 60 hours tracking a signal booster that was causing harmful interference, while AT&T had an incident in Florida in which a signal booster located on a yacht caused

⁴ The primary impact for public safety entities is from signal boosters that may be used to boost Sprint Nextel spectrum in that certain 800 MHz spectrum utilized by Sprint Nextel that is still interleaved with public safety spectrum, in spite of the 800 MHz rebanding commenced in WT Docket 02-55.

⁵ *NPRM* at para. 21.

harmful interference to six cell sites.⁶ This last interference incident lasted for 21 hours and led to almost 3,000 dropped calls and over 81,000 blocked or impaired calls because the signal booster was too close to the cell towers.⁷

For public safety entities, the adverse effects of signal boosters likewise have been significant. In particular, in King County, Washington, the Washington Regional Communications Board experienced an outage in which signal booster oscillation blocked all 800 MHz public safety communications for 10-20 square blocks.⁸ Other localities have likewise experienced interference from signal boosters, which have disrupted 800 MHz public safety communications, including San Bernardino County, California – which experienced oscillating interference to a primary 800 MHz receiver site for over a month. This interference hampered the County’s public safety communications.⁹

In addition to interference to normal communications, handset based signal boosters also have had the unintended consequence of disrupting network-based E911 systems that use global positioning technologies to determine the location of a mobile handset.¹⁰ Essentially, these network based systems determine a handset’s location by comparing the time it takes a cell signal to reach multiple Location Measurement Units (“LMUs”) installed at the carrier’s cell sites.¹¹ As a result, handsets operating with signal

⁶ *Id.*

⁷ *Id.*

⁸ Comments of the King County, Washington Regional Communications Board, WT Docket No. 10-4, at 2 (filed February 5, 2010).

⁹ Comments of County of San Bernardino, WT Docket No. 10-4, at 1 (filed February 5, 2010).

¹⁰ *NPRM* at para. 19; *Ex Parte Letter from AT&T Services, Inc.* at 3 (May 28, 2010).

¹¹ See “U-TDOA – Uplink Time Difference of Arrival,” TruePosition, <http://www.trueposition.com/web/guest/utoda>.

boosters transmit two signals that are received by the LMU – the boosted signal and the original unboosted handset signal.¹² Because the LMU receives both the boosted handset signal and the original handset signal, its positioning calculations have been known to be skewed by up to several kilometers. This range of error is significant, because in the event of an emergency, (a) the PSAP may not dispatch the closest first responders to the emergency and (b) if the location is based upon cell phone technology – the first responders may not be able to locate the caller/victim in a timely manner, if at all. As a result, the caller, knowing that he/she has an E911 enabled handset, may not receive timely assistance in the event of an emergency. While this problem may be less problematic in urbanized areas where multiple callers can call in an emergency – and thereby provide an updated location – it is more acute where the caller is either alone or in a rural setting where bystander assistance is unlikely. Accordingly, the Commission should restrict the types of signal boosters to those well-designed signal boosters that are not likely to cause harmful interference to other carriers/licensees or cause the provision of inaccurate location data.

¹² *Ex Parte Letter from AT&T Services, Inc.* at 3.

III. The Commission's Alternate Proposal to Authorize Consumer Signal Boosters Under Section 1.903(c) of the Commission's Rules will Provide Carriers with the Necessary Tools to Prevent Harmful Interference to Other Carriers and Licensee Systems.

a. The Commission Should Not Authorize Signal Boosters in the Citizens Band Radio Service.

The Blooston Licensees oppose the Commission's proposed regulatory scheme to authorize well-designed consumer signal boosters in the Citizens Band Radio Service under Part 95 of its Rules and urge the Commission to adopt its alternate proposal by authorizing properly certificated signal boosters under the existing carrier's license – much like existing handsets and air-cards – in accordance with Sections 1.903(c) and 22.3 of the Commission's Rules. Currently, Commercial Mobile Radio Service (“CMRS”) licensees have the exclusive use of their licensed spectrum and the Commission's current rules make the CMRS provider the licensee of all transmitting equipment on its spectrum – whether it be carrier or subscriber owned. By enforcing the existing regulations that are currently in place, the Commission can empower CMRS carriers to ensure that only compliant subscriber owned equipment is activated on the carrier's system. In this way, problems associated with E911 location accuracy and harmful interference to adjacent channel carriers and public safety entities should be minimized, if not eliminated altogether.¹³ If carriers are not provided with this element of

¹³ The Blooston Licensees recognize that other forms of interference (e.g., oscillation) will require other methods of abatement, including, but not limited to automatic deactivation of the device, as proposed by the Commission. Nonetheless, as the record reflects, a significant issue with signal boosters is that carriers and affected licensees are

control, the Blooston Licensees are concerned that the risks of harmful interference, while mitigated, will nonetheless continue to be a significant risk.

b. The Blooston Licensees Support a Scheme Which Ties Individual Signal Boosters to a Particular Carrier's Standards and Requires Activation of the Signal Booster by that Carrier.

As indicated above, the Blooston Licensees strongly advocate requiring signal booster equipment to be carrier specific and carrier activated. Thus, beyond the broad based safeguards that might be required by the Commission (e.g., automatic deactivation for any signal booster that goes into oscillation), the Blooston Licensees submit that signal boosters must be designed to the specifications of the discrete wireless carriers and be activated by that particular carrier. The Blooston Licensees have no objection to these devices being marketed and sold by third party vendors provided that the signal boosters are approved by the carrier, certified by the Commission for the particular carrier's network and activated by that carrier. In this way, consumers will have easy access to well-designed signal boosters and carriers will have the necessary control in order to ensure that only compliant, well-designed signal boosters are activated and placed into service.

often unable to locate the source of signal booster interference in a timely manner. While technology that is designed to automatically shut down errant signal boosters will be helpful in mitigating these sorts of harmful interference issues, the Blooston Licensees believe that tying signal boosters to a particular carrier's network, much like an air-card or handset, is still necessary. This is because of the potential for the "shut down" technology to fail or for the signal booster to lock-up. And, like any mechanical or electronic device, even a fail-safe shutdown has the potential to fail.

The Blooston Licensees support AT&T's proposal¹⁴ and believe that the following safeguards would be beneficial to ensure adequate controls and to eliminate the potential for harmful interference from signal booster devices:

- Signal boosters must be under the control of the carrier and be activated by the carrier. In making this requirement, the signal booster would be required to have technology that enables the carrier's wireless network to identify the device as a signal booster, to locate the signal booster at all times, and if necessary, to disable the signal booster if it is causing harmful interference and the signal booster does not automatically shut down.¹⁵
- Signal boosters must be carrier specific so that they are designed to transmit only on the frequencies authorized for use by the particular carrier whose signal is to be boosted. By limiting the frequencies that the signal booster can transmit on, the likelihood of harmful interference to other networks is greatly diminished since the signal booster is not capable of transmitting on those adjacent frequencies.
- The Commission should use the current multi-step certification process that is currently in use for wireless handheld devices.
- The Commission must strictly prohibit and take enforcement action against the manufacturer/importation, sale and distribution of non-compliant signal booster equipment.

The costs for this regulatory scheme to consumers would be minimal. The Blooston Licensees fully support the notion that this sort of equipment should be available through third parties in the same manner that pre-paid wireless devices are available at carrier-owned retail outlets and third-party outlets such as department stores,

¹⁴ See *Ex Parte* filing by AT&T Services, Inc. dated May 28, 2011 to FCC at 7-9.

¹⁵ This latter feature is critical inasmuch as Cobb County, Georgia had an experience with interference from a signal booster that was eliminated by unplugging it only to have it plugged back in – thereby requiring Cobb County to once again locate the signal booster and disable it. See Comments of Cobb County, Georgia E-911, WT Docket No. 10-4, at 1 (filed January 19, 2010).

discount houses, electronics stores and grocery stores. And, just like those pre-paid devices, carrier activation would still be required.

IV. Unauthorized Signal Boosters Should Not Be Grandfathered.

The Blooston Licensees are adamant that signal boosters that do not comply with the Commission's current rules (meaning that they were installed without the approval of the underlying carrier) should not be grandfathered. This is because the purpose of this proceeding is to eliminate the harmful interference that carrier networks and public safety systems are experiencing from what amount to illegal signal boosters. By grandfathering such devices, the Commission would only perpetuate what is already a difficult problem for carriers and public safety entities. In order to make the public aware of the problems associated with illegal signal boosters, the Blooston Licensees urge the Commission to undertake an aggressive public education program in order to educate manufacturers, importers, retailers and users of these devices to the interference issues and the enforcement consequences of the continued use of such devices. In this way, the Commission can be assured that all reasonable steps have been taken to mitigate the problem of non-compliant signal boosters.

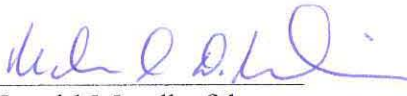
V. Conclusion.

As demonstrated in the record and herein, there is no question that there is a genuine need for consumer access to well-designed signal booster equipment. The issue is the prevention of interference to commercial wireless and public safety communications systems. As a result, it is critically important that signal booster

equipment be designed so that is capable of operating only on the intended carrier's frequency bands and that it will automatically shut down in the event that the signal booster detects that it has gone into oscillation or is otherwise causing harmful interference. Wireless carriers must also have the ability to control signal boosters that are activated on their systems, so that if interference is detected and the device has not automatically shut down, the carrier is in a position to locate the device and turn the device off – much like trunked radio systems are able to do with mobile radios that have open microphones. Finally, the Blooston Licensees urge the Commission to not grandfather any signal booster device that was installed without carrier permission and to institute a public education program to weed out those non-compliant signal boosters.

Respectfully submitted,

THE BLOOSTON LICENSEES

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Attachment A

BEK Communications Cooperative
Citizens Telephone Company of Higginsville, Missouri
Custer Telephone Cooperative, Inc.
Dakota Central Telecommunications Cooperative
KTC AWS LLC
Midvale Telephone Exchange, Inc.
Mobile Phone of Texas, Inc.
Nucla Naturita Telephone Company
Penasco Valley Telephone Cooperative, Inc.
Radio Communications Systems, Inc.
Sagebrush Cellular, Inc.
Smithville Communications, Inc.
Star Telephone Company, Inc.
Uintah Basin Electronic Telecommunications
United Telephone Association, Inc.
Walnut Telephone Company, Inc.
Webster-Calhoun Cooperative Telephone Association